# Enhancing the Operation Of Highly Varying Industrial Loads To Increase Electric Reliability, Quality, And Economics


*Principal Investigator*
Dr. Robert Kramer
Chief Scientist
NiSource Energy Technologies

Dr. Rahmat Shoureshi
Colorado School of Mines

Dr. Thomas Sparrow, Dr. Douglas Gotham
Dr. Chee-Mun ONG, Dr. Thomas Brady
Purdue University

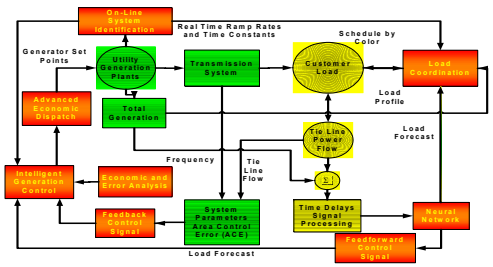
*Subcontract Manager*
D. Tom Rizzy
ORNL

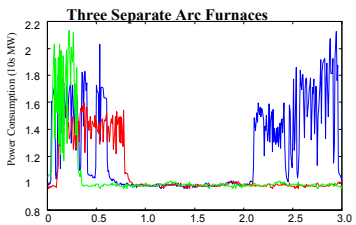

## Purpose Of The Research

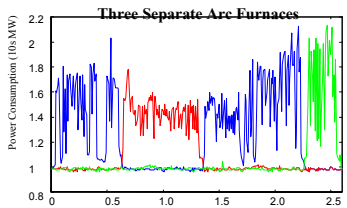
**Develop a way to increase electric reliability and quality as well as increasing industrial productivity and energy utilization by reducing the electric fluctuations caused by large industrial loads by coordinating the startup of large loads so that they tend to cancel out the electric transients from each other while at the same time enhancing various related industrial processes.**

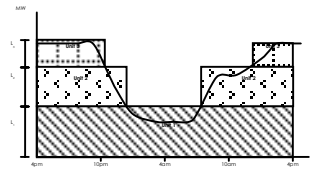
## Accomplishments For The Year

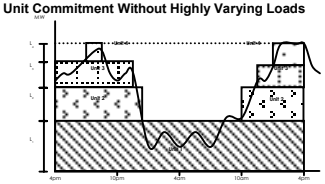
- Completed IAGC Module
- Completed Control Sub Allocation Module
- Completed Load Coordination Module
- Completed Arc Furnace and Rolling Mill Modules
- Completed Economic Module
- Completed Model Integration

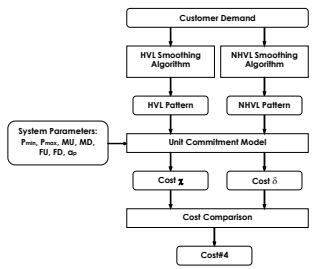


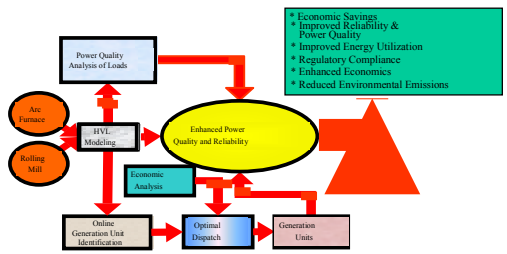





Unit Commitment Without Highly Varying Loads


Unit Commitment With Highly Varying Loads




Economic Analysis Flow Chart




Project Integration

DE ER

NiSource Energy Technologies
A NiSource Company